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## ABSTRACT

ENROLV2 is a FORTRAN coded enrollment projection program designed to forecast public school student enrollment from a sample background data matrix. With this program the user can employ a variety of approaches to the projection of both initial grade data and the body of the background matrix. Beginning with the background data (the enrollment for each grade for a user-specified number of years), the program first extends the initial grade information according to any of the six user-specified methods. These include both averaging and regression methods. Next the program computes the body of the projections employing a common survival ratio method, or various choices of a linear regression. The reliability of the method employed is estimated and published as a part of each report. Included in this booklet is a brief explanation of the program, sample inputs, and sample outputs. (Author/JK)

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ENROLLMENT PROJECTIONS

ENROLV2

Wisconsin Information Systems for Education

Department of Educational Administration

The University of Wisconsin

Madison

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September 1972

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### Acknowledgements

As is often the case with computer programs, there is an evolution to their development. The original thought for this program came from Frank Farner in his discussion of Enrollment Projections.<sup>1</sup> The original version prior to this one was developed in 1966. Several versions were developed. Lyle Hunter provided the basic coding for the current version supplying many imaginative approaches to the combined batch-interactive capability of the program. Professor Dennis W. Spuck supervised the re-writing of this version.

## Introduction

ENROLV2 is a FORTRAN coded enrollment projection program designed to forecast public school student enrollments from a simple background data matrix. With this program the user can employ a variety of approaches to the projection of both initial grade data and the body of the background matrix. Beginning with the background data (the enrollment for each grade for a user-specified number of years) the program first extends the initial grade information according to any of six user specified methods.<sup>1</sup> These include both averaging and regression methods. Next the program computes the body of the projections employing a common survival ratio method, or various choices of linear regression.

The reliability of the method employed is estimated and published as a part of each report. The program compares an estimate of the final year of the background data with the actual enrollment in order to determine a coefficient of reliability. This procedure is useful when deciding upon the most useful forecast.

The program is designed to operate in either a batch or interactive mode and contains alternate print and read statements for each. In the teletype mode, the program offers appropriate cues for data entry.

## The Problem

The school district administrator requires accurate and timely projections of school enrollments. Decisions affecting many aspects of school life are dependent upon this information. Personnel decisions, site acquisition, building programs, transportation, logistics, and food services, are some key examples of the imperative need for accurate enrollment projections.

Approaches to the forecasting problem range from the simple to the sophisticated. Zabrewski and Zinter,<sup>2</sup> Rensselaer Research Corporation<sup>3</sup> discuss a variety of methods including correlation analysis, market analysis, and cohort survival ratio methods. Most of the literature illustrates variations on survival techniques. In addition to common survival methods, linear regression methods were decided upon for this program. Campbell and Siegel,<sup>4</sup> Simon and Fuller,<sup>5</sup> Rensselaer Research Corporation,<sup>6,7</sup> and Webster<sup>8</sup> all report successful regression applications. Webster's extensive work covers a wide variety of methods from which three conclusions may be drawn:

1. Cohort survival techniques often fail to predict school populations accurately
2. Linear regression often appears to be the most successful method
3. Multiple predictors are not any more efficient than simple time on enrollment methods

Webster indicates that methodology is situational and various methods are appropriate at different times. Weitzel<sup>9</sup> maintains that annual projections should be made and only the last three years of known data should be considered, but Simon and Fuller<sup>10</sup> take a more widely accepted view that ten years of background data and ten year projections may be useful, especially if the data matrix has some inherent stability. All agree that long-range projections should be viewed with caution.

#### Calculations of Survival Ratios

The calculation of the survival ratios, linear regression equations, and initial grade data are central to the program. Each will be discussed and its function in the program explained.

A survival ratio is defined as the quotient of the enrollment in a given grade during a given year divided by the enrollment in the previous grade the previous year. Let's assume ten years of background data over twelve grades as input. Such a matrix will produce nine pairs of adjacent years and

eleven pairs of adjacent grades. Ninety-nine survival ratios must be computed. There exists a set of ratios for each pair of adjacent grades from which one can compute an average ratio and an estimate of variability. A standard deviation is computed as an estimate of the variability. High and low survival ratios may be determined by adding or subtracting some portion of a standard deviation to the mean. The fractional part employed for this purpose may be specified on the parameter card. If no selection is made, the program will automatically identify one standard deviation as the variability factor.

Sample input (page 12) illustrates the data necessary for the computation of survival ratios. Observing the first two columns of background data, it is possible to compute a column of nine separate survival ratios.

214 ÷ 227 =	.943	261 ÷ 269 =	.970
239 ÷ 253 =	.945	265 ÷ 273 =	.971
242 ÷ 259 =	.934	248 ÷ 276 =	.899
254 ÷ 262 =	.969	248 ÷ 268 =	.925
290 ÷ 282 =	1.028		

Each of these ratios expresses an estimate of the proportion of kindergarteners who survive to the first grade. These methods take no specific account of in or out migration, but simply compute the ratio of overall estimated survival. From the set of nine survival ratios, we wish to arrive at the most reasonable single estimate. The average or mean survival ratio often represents a single good estimate and is computed by summing the ratios and dividing by nine.

$$S_j = \frac{\sum_{i=1}^N S_{i,j}}{N} = .954$$

J = Number of survival vectors  
j = 1, J

(See Grade 1-2 mean SR, page 14, for additional computations.)  
Where S = Survival ratio for specified year.

Average survival ratios are estimated for each set of grade enrollments thus producing a set of average ratios referred to as the average survival vector.



Each distribution of survival ratios has some level of variability. The program computes the variability as a standard deviation. In order to produce a high or low estimate, the program permits a portion of the standard deviation to be added to the mean for a high estimate or subtracted for a low estimate. An additional option permits the user to enter his own best estimate of the survival ratios.

### Projection Using Linear Regression

Two basic approaches to the computation of regression for projecting enrollment are included in this program. Both hold enrollment as the dependent variable. The predictive or independent variable may be time or prior year enrollment. In addition, the program permits a log transformation of the data. Three regression techniques may be employed. They are:

1. Predicting enrollment as a function of prior enrollment.

$$Y = A_0 + B_0X$$

Where

Y = enrollment

X = enrollment for prior year & prior grade

$A_0$  &  $B_0$  are the computed coefficients for minimizing the squared ERROR in Y from X.

2. Predicting enrollments as a function of time with log transformation of enrollment.

$$Y = A_1 B_1^X$$

$$\text{LOG } Y = \text{LOG } A_1 + X \text{LOG } B_1$$

Where

Y = enrollment at time t (computed as LOG of enrollment)

X = year of data beyond the first year

### 3. Predicting enrollment as a function of time.

$$Y = B_2X + A_2$$

Where

Y = enrollment

X = time of enrollment

e.g.      1968 = 1  
            1970 = 2  
            1971 = 3

The regression techniques may be selected as an alternative to the survival ratio methods. The program will compute both regression and survival ratio projections as desired for each run. In addition to the standard output, the regression equations are included when requested.

#### Initial Grade Data

The computation of initial grade data is essential to the accuracy of the projection. There are six possible approaches. Most enrollment projection techniques employ the survival concept for analysis. That is to say, the enrollment for any given year is to some extent dependent upon the enrollment in the prior grade for the prior year. This is like saying the number of six year olds this year is in some way related to the number of 5 year olds last year. It is not a bad initial assumption. If a methodology is based upon a prior year, prior grade notion, how does one begin? The initial grade in the analysis cannot, by definition, be predicated on a prior grade. However, it is possible to predict from a prior year. To extend our age analogy, it is possible to get some estimate the number of one-year olds from the number of zero year olds, but no prior age bracket exists for projecting the number of births. However, we could assume that the number of births this year is in some way predictable from the number of births last year. It is this line of reasoning which dictates the methodology for the projection of initial grade data.

The initial column of an enrollment table includes the number of students enrolled in that grade for each of several years. (See Page 12). An initial grade data projection is an attempt to systematically project ahead based upon the evidence of the past. Six approaches to the estimation of Initial Grade Data are included in the program and they are:

1. Mean annual arithmetic change

$$M = \frac{\sum_{i=2}^N (X_{i,1} - X_{(i-1),1})}{N-1}$$

N = Number of years of background data

The average change is then incrementally added to the last enrollment in the initial grade. This yields a straight-line projection based upon the average historical change.

#### CALCULATION OF AVERAGE CHANGE-IGD

See Page 12 for the Sample Data

<u>Enrollments</u>	<u>Change</u>
227	
253	26
259	6
262	3
282	20
269	-13
273	4
276	3
268	-8
267	-1
	<u>40</u>

$$40 \div 9 = 4.444$$

Therefore mean annual change is 4.444

#### Projected IGD

271.44444		271
275.88888		276
280.33332	When	280
284.77776	Rounded	285
289.22220		289
293.66664		294

2. Mean annual percentage change:

$$M_1 = \sum_{i=2}^N \left[ \frac{(X_{i,j} - X_{(i-1),1})}{X_{(i-1),1}} \right]$$

Where N = number of years of background data.

The average percentage change is then incrementally multiplied by the last enrollment in the initial grade. This yields a curvilinear projection of the initial grade.

CALCULATION OF AVERAGE CHANGE-IGD

<u>Change</u>	<u>Enrollment</u>	<u>Percentage Change</u>
26	227	11.45
6	253	2.37
3	259	1.15
20	262	7.63
-13	282	-4.60
4	269	1.48
3	273	1.09
-8	276	-2.89
-1	268	- .37
	267	
		<u>17.31</u>

$$17.31/9 = 1.9233\% \text{ Change}$$

1.019233 is multiplier

$$1.019233 \times 267 = 272.135211$$

<u>Projections</u>	<u>Rounded</u>
272.135211	272
277.369188	277
282.703830	283
288.141073	288
293.682890	294

3. Mean annual percentage with highest and lowest changes excluded:

The computation is exactly the same as for the annual percentage change case except that the + 11% and -4% changes have been removed. The

purpose of this methodology is to remove the effect of highly deviant years.

4. Mean annual percentage change with deviant changes excluded:

The program computes the standard deviation of percentage change. Each percentage change larger than the standard deviation is eliminated. The remaining percentages are used to compute an average. The purpose is, as in method three, to eliminate any highly deviant changes which may bias the estimate.

5. Regression - enrollment predicted as a function of time.

$$\text{The } Y = BX + A$$

Where:

Y = enrollment

X = time beyond the first year of background

B + A are coefficients computed which minimize squared error in Y from X

6. Regression - enrollment predicted as a function of the log of Y.

$$\text{LOGY} = \text{LOGA} + X\text{LOGB} \text{ OR } Y = AB^X$$

Where:

Y = enrollment

X = time beyond the first year of background

No X = prior year

These regression methods are identical to those expressed for the body of the prediction for the initial grade, however, no prior grade exists. Therefore, only two regression models are appropriate for the extension of the initial grade.

Summary of Input

The program requires a background data matrix the characteristics of which are projected into the future. A basic assumption of the methodology is that the conditions of the background data are sufficient for projecting

future enrollment figures. In addition to the background data, specific grade enrollments year by year, it is necessary to supply a variety of parameters which dictate the nature of the projections to be made. The input data cards are summarized as follows:

Summary of Input Data Cards (See page 45 - Sample Data Form)

<u>Card Type</u>	<u>Col.</u>	<u>Description</u>
1	1-72	Title - 72 columns - free format
2		Initial parameter card
	1-2	Number of grades included in the analysis (IGR)
	3-4	Number of years of background data (IYR)
	5-6	Code for initial grade data method (IGD)
		1 = arithmetic average
		2 = mean percentage change
		3 = mean percentage less high and low
		4 = mean percentage less deviates
		5 = regression-time on enrollment
		6 = regression-time on log of enrollment
	7-8	Number of years to be projected (IPRG)
		Background data and number of years projected
		Must be equal to or less than 25.
	9-10	Code for projection method (ISRV)
		0 = regression method 1, 2 or 3
		1 = high survival ratio method
		2 = low survival ratio method
		3 = mean survival ratio method
		4 = introduced survival ratio
	11-12	Lowest grade in the analysis (IGF)
	13-14	Highest grade in the analysis (IGL)

<u>Card Type</u>	<u>Col.</u>	<u>Description</u>
	15-18	Base year of background data-most current (IBASE)
	19-22	Portion of survival ratio variability to be employed for low and high estimates. (SUP)
	23-24	Method for projecting by regression (IREG)
		ISRU must = 0
		0 = survival ratios to be employed
		1 = regression-enrollment on enrollment
		2 = regression-time on log of enrollment
		3 = regression-time on enrollment
3		Groups of grades (Maximum of 8)
	1-2	Number of groups of grades in analysis
	3-4	Lowest grade in 1st group
	5-6	Highest grade in 1st group
	7-8	Lowest grade in 2nd group
	9-10	Highest grade in 2nd group
	11-12	Lowest grade in 3rd group
	13-14	Highest grade in 3rd group
		- continue in pairs up to the 8th group -
	37-38	Highest grade in 8th group
		Note: specify kindergarten as 0
		N background data cards
	1-4	Enrollment in initial grade
	5-8	Enrollment in initial + 1
	9-12	Enrollment in initial + 2
		- succeeding fields contain enrollment data by grade -
	69-72	Enrollment in initial + 17
		Note: FORMAT for data input matrix (18F4.0)

<u>Card Type</u>	<u>Col.</u>	<u>Description</u>
5		Introduced survival vector (18F4.3)
	1-4	Introduced survival ratio-initial grade
	5-8	Introduced survival ratio-initial grade + 1
	9-12	Introduced survival ratio-initial grade + 2
	13-16	Introduced survival ratio-initial grade + 3
	65-68	Introduced survival ratio-initial grade + 16
		Note: If no introduced survival ratios must enter a blank card.
6		Additional parameter card(s) same as card 2.
		As many as desired.
7		End with a blank card.



TABLE 1

## SAMPLE INPUT

@RUN } System RUN and  
 @XOT } execute instructions.

\*\*\* THE DALLIES \*\*\*      JUNE 10, 1965 ← Title card  
 1210 615      1121964      3 ← Initial parameter card  
 0 1 6 1 3 4 6 7 9 9 121012 612 112 ← Groups of grades  
 227 204 222 206 233 206 164 190 239 223 211 175  
 253 214 224 230 188 238 207 170 275 245 201 205  
 259 239 189 217 228 197 223 215 220 275 225 178  
 262 242 222 209 212 238 198 226 314 229 255 211  
 282 254 236 214 218 222 246 197 335 280 214 230  
 269 250 249 247 222 226 233 242 325 274 199 219  
 273 261 292 227 242 221 228 235 272 198 253 208  
 276 265 287 238 253 224 237 246 265 222 261 214  
 268 248 255 272 244 262 220 248 265 265 222 251  
 267 248 279 281 244 268 223 243 273 261 229 241  
 1020102010201020102010201020102010201020102010201020 ← Introduced survival vector  
 1210 115      1121964      1  
 1210 115 3 1121964.125  
 1210 515      1121964      2  
 1210 415 3 1121964.450  
 1210 315 1 1121964.200  
 1210 415      1121964      3  
 1210 215      1121964      2  
 1210 315      1121964      1  
 1210 315 2 1121964.300  
 1210 215 4 1121964.150  
 1210 215 2 1121964.200  
 (BLANK CARD)  
 @FIN

Background Data

Additional parameter cards

## **SAMPLE OUTPUT**

## Program Output

The program output contains the following:

1. Computed survival ratios including a summary of the high, low, mean and introduced survival ratio vector.
2. Echo print of portion of standard deviation employed for low and high estimates.
3. Computed reliability coefficients. The composite reliability is the sum of the proportion error between the actual and predicted values of the last year of background data. The mean reliability coefficient is the average of the proportion error of the last year of background data.
4. Echo print of background data.
5. Projected data matrix.
6. When regression methods are employed, a summary of the regression model is also produced.

## SAMPLE OUTPUT

### Discussion

#### Survival Ratios

The survival ratios on the following page are the result of the ratio computations computed from the background data. The method is explained on page 2. The table of ratios indicates relative stability of the historical data with a few possible exceptions. The low average ratio for the 1st to 2nd grade may be the effect of local private schools. Children often attend public school for early grades. When this occurs, it is common to see the effect of these students returning to the public schools during the later years of education. The sample data indicates an average increase of 30.7% for the 8th to 9th grade. The variance of the distribution for 1st to 2nd grade is small, indicating a stable situation for the local private schools.

The low and high estimates of the survival ratios are the result of respective addition and subtraction of .125 times the standard deviation. These computed survival ratios will be used for all subsequent computations.

\*\*\* THE DALLIES \*\* JUNE 10, 1965

COMPUTED SURVIVAL RATIOS  
GRADES

YEARS	1- 2	2- 3	3- 4	4- 5	5- 6	6- 7	7- 8	8- 9	9-10	10-11	11-12
55 56 *	.943	1.098	1.036	.913	1.021	1.005	1.037	1.447	1.025	.901	.972
56 57 *	.945	.883	.969	.991	1.048	.937	1.039	1.294	1.000	.918	.886
57 58 *	.934	.929	1.106	.977	1.044	1.005	1.013	1.460	1.041	.927	.938
58 59 *	.969	.975	.964	1.043	1.047	1.034	.995	1.482	.892	.934	.902
59 60 *	1.028	.980	1.047	1.037	1.037	1.050	.984	1.650	.818	.711	1.023
60 61 *	.970	1.007	.912	.980	.995	1.009	1.009	1.124	.609	.923	1.045
61 62 *	.971	1.100	.815	1.115	.926	1.072	1.079	1.128	.816	1.318	.846
62 63 *	.899	.962	.948	1.025	1.036	.982	1.046	1.077	1.000	1.000	.962
63 64 *	.925	1.125	1.102	.897	1.098	.851	1.105	1.101	.985	.864	1.086

GRADES	HIGH SR	LOW SR	MEAN SR	INTRO SR	STAND. DEV.
1 2	.958	.949	.954	1.020	.037
2 3	1.017	.996	1.007	1.020	.084
3 4	1.000	.977	.989	1.020	.094
4 5	1.006	.989	.999	1.020	.067
5 6	1.034	1.022	1.028	1.020	.047
6 7	1.002	.986	.994	1.020	.066
7 8	1.039	1.029	1.034	1.020	.039
8 9	1.333	1.281	1.307	1.020	.210
9 10	.927	.892	.910	1.020	.142
10 11	.964	.924	.944	1.020	.161
11 12	.972	.952	.962	1.020	.079

LOW SR = MEAN SR - .125 \* STANDARD DEVIATION

HIGH SR = MEAN SR + .125 \* STANDARD DEVIATION

### Reliability Coefficients

Using the method selected on the input parameter card, the last year of background data are predicted. In order to provide some comparison with other projection methods, two reliability coefficients are computed.

### Composite Reliability Coefficient

ACTUAL DATA											
	<u>Grade</u>										
	2	3	4	5	6	7	8	9	10	11	12
Actual	248	279	281	244	268	223	243	273	261	229	241
Predicted	257	252	255	247	252	263	229	331	246	256	216
% Error	.036	-.096	-.092	.121	-.059	.177	-.059	.211	.059	.116	-.105

Average Composite Reliability Coefficient is .192

$$\sum x_i$$

Mean Reliability Coefficient is .103

$$\frac{\sum x_i}{N}$$

Where: X is the percent error for ith prediction

N is the number of predictions.

**\*\* RELIABILITY COEFFICIENTS \*\***

VALUES UNDER .10 IN ABSOLUTE VALUE ARE CONSIDERED GOOD

GRADES PROJECTED RELIABILITY  
ENROLLMENT COEFFICIENT  
1964

2	257.	.036
3	252.	-.096
4	255.	-.092
5	274.	.121
6	252.	-.059
7	263.	.177
8	229.	-.059
9	331.	.211
10	246.	-.059
11	256.	.116
12	216.	-.105

THE COMPOSITE RELIABILITY COEFFICIENT IS .192

THE MEAN RELIABILITY COEFFICIENT IS .103

### Enrollment Summary

The output includes an estimate of the yearly enrollment based upon the selected parameters. The summary includes a heading summarizing the parameters. The clustered groups of grades are totaled and printed in order to illustrate possible clustering for the use of school facilities.



\*\*\* THE DALLAS \*\* JUNE 10, 1965

# GRADED ENROLLMENT BY YEARS

SCHOOL GRADES												
YEARS *	1	2	3	4	5	6	7	8	9	10	11	12
1955 *	227.	204.	222.	206.	233.	206.	164.	190.	239.	223.	211.	175.
1956 *	253.	214.	224.	230.	188.	238.	207.	170.	275.	245.	201.	205.
1957 *	259.	239.	189.	217.	228.	197.	223.	215.	220.	275.	225.	178.
1958 *	262.	242.	222.	209.	212.	238.	198.	226.	314.	229.	255.	211.
1959 *	282.	254.	236.	214.	218.	222.	246.	197.	335.	290.	214.	230.
1960 *	269.	290.	249.	247.	222.	226.	233.	242.	325.	274.	199.	219.
1961 *	273.	261.	292.	227.	242.	221.	228.	235.	272.	198.	253.	208.
1962 *	276.	265.	287.	238.	253.	224.	237.	246.	265.	222.	261.	214.
1963 *	268.	248.	255.	272.	244.	262.	220.	248.	265.	265.	222.	251.
1964 *	267.	248.	279.	281.	244.	268.	223.	243.	273.	261.	229.	241.

## PROJECTIONS-IGO BASIS 5 REGRESSION TYPE 3 \*HIGH SURVIVAL RATIOS

1965 *	283.	256.	252.	279.	283.	252.	269.	232.	324.	253.	252.	223.
1966 *	286.	271.	260.	252.	281.	292.	253.	279.	309.	300.	244.	245.
1967 *	290.	274.	275.	260.	254.	290.	293.	263.	372.	286.	290.	237.
1968 *	293.	277.	279.	276.	262.	262.	291.	304.	350.	345.	276.	282.
1969 *	296.	281.	282.	279.	277.	271.	263.	302.	406.	325.	333.	268.
1970 *	300.	284.	286.	282.	281.	287.	271.	273.	403.	376.	313.	323.
1971 *	303.	287.	289.	286.	284.	290.	287.	282.	364.	374.	363.	304.
1972 *	307.	291.	292.	289.	287.	294.	291.	298.	376.	338.	360.	353.
1973 *	310.	294.	296.	292.	291.	297.	294.	302.	398.	349.	326.	350.
1974 *	314.	297.	299.	296.	294.	301.	298.	306.	403.	369.	336.	317.

## GROUPS OF GRADES

YEARS	1 6	1 3	4 6	7 9	9 12	10 12	6 12
1964	1587.	794.	793.	739.	1004.	731.	1738.
1965	1605.	791.	814.	824.	1051.	727.	1804.
1966	1643.	817.	825.	841.	1098.	789.	1922.
1967	1644.	839.	804.	928.	1185.	813.	2031.
1968	1649.	849.	800.	945.	1253.	903.	2110.
1969	1686.	859.	827.	971.	1331.	926.	2167.
1970	1719.	870.	850.	948.	1416.	1013.	2247.
1971	1739.	880.	860.	933.	1405.	1041.	2264.
1972	1760.	890.	870.	965.	1427.	1051.	2309.
1973	1780.	900.	880.	994.	1422.	1024.	2316.
1974	1801.	910.	891.	1006.	1424.	1022.	2328.

\*\*\* THE DALLES \*\* JUNE 10, 1965

# GRADED ENROLLMENT BY YEARS

## SCHOOL GRADES

YEARS *	1	2	3	4	5	6	7	8	9	10	11	12
*****												
1955 *	227.	204.	222.	206.	233.	206.	164.	190.	239.	223.	211.	175.
1956 *	253.	214.	224.	230.	188.	238.	207.	170.	275.	245.	201.	205.
1957 *	259.	239.	189.	217.	228.	197.	223.	215.	220.	275.	275.	173.
1958 *	262.	242.	222.	209.	212.	238.	198.	226.	314.	229.	255.	211.
1959 *	282.	254.	236.	214.	218.	222.	246.	197.	335.	280.	214.	230.
1960 *	269.	290.	249.	247.	222.	226.	233.	242.	325.	274.	199.	219.
1961 *	273.	261.	292.	227.	242.	221.	228.	235.	272.	198.	253.	208.
1962 *	276.	265.	287.	238.	253.	224.	237.	246.	265.	222.	261.	214.
1963 *	268.	248.	255.	272.	244.	262.	220.	248.	265.	265.	222.	251.
1964 *	267.	248.	279.	281.	244.	268.	223.	243.	273.	261.	229.	241.

## PROJECTIONS - IGD BASIS 1 ARITHMETIC AVE \* REGRESSION 1 \*

1965 *	271.	255.	250.	271.	279.	251.	264.	231.	311.	245.	241.	220.
1966 *	276.	259.	257.	245.	269.	286.	247.	273.	296.	275.	228.	231.
1967 *	280.	263.	261.	251.	243.	276.	281.	256.	345.	263.	253.	219.
1968 *	285.	268.	265.	255.	249.	250.	272.	291.	325.	302.	243.	242.
1969 *	289.	272.	270.	259.	253.	256.	247.	281.	366.	286.	275.	233.
1970 *	294.	276.	274.	263.	257.	260.	253.	255.	355.	318.	262.	262.
1971 *	298.	280.	278.	267.	261.	254.	256.	261.	324.	309.	288.	250.
1972 *	303.	285.	283.	271.	265.	268.	260.	265.	332.	285.	281.	274.
1973 *	307.	289.	287.	275.	269.	272.	264.	269.	336.	291.	262.	268.
1974 *	311.	293.	291.	279.	272.	276.	268.	273.	341.	295.	266.	250.

## GROUPS OF GRADES

YEARS	1 6	1 3	4 6	7 9	9 12	10 12	6 12
1964	1587.	794.	793.	739.	1004.	731.	1738.
1965	1577.	776.	801.	805.	1017.	706.	1762.
1966	1592.	792.	800.	817.	1030.	734.	1837.
1967	1575.	805.	770.	882.	1080.	735.	1894.
1968	1572.	818.	754.	888.	1112.	787.	1925.
1969	1599.	831.	768.	894.	1160.	794.	1944.
1970	1624.	844.	780.	862.	1197.	842.	1964.
1971	1649.	857.	792.	842.	1172.	848.	1954.
1972	1673.	870.	803.	857.	1173.	841.	1966.
1973	1698.	883.	815.	869.	1157.	820.	1961.
1974	1723.	896.	827.	881.	1151.	810.	1968.

\*\*\* THE DALLIES \*\* JUNE 10, 1965

GRADES COMPUTED LINEAR REGRESSION EQUATIONS

\*\*\*\*\*

1	2	LOG Y = LOG	244.096 + X LOG	1.014
2	3	LOG Y = LOG	217.152 + X LOG	1.022
3	4	LOG Y = LOG	199.787 + X LOG	1.037
4	5	LOG Y = LOG	198.299 + X LOG	1.030
5	6	LOG Y = LOG	204.766 + X LOG	1.019
6	7	LOG Y = LOG	204.150 + X LOG	1.021
7	8	LOG Y = LOG	190.454 + X LOG	1.024
8	9	LOG Y = LOG	180.660 + X LOG	1.036
9	10	LOG Y = LOG	263.483 + X LOG	1.009
10	11	LOG Y = LOG	242.170 + X LOG	1.003
11	12	LOG Y = LOG	210.890 + X LOG	1.013

X IS TIME

Y IS ENROLLMENT

•• RELIABILITY COEFFICIENTS ••

VALUES UNDER .10 IN ABSOLUTE VALUE ARE CONSIDERED GOOD

GRADES PROJECTED RELIABILITY  
ENROLLMENT COEFFICIENT  
1964

2	287.	.157
3	284.	.019
4	290.	.032
5	258.	.057
6	250.	-.065
7	244.	.094
8	251.	.031
9	266.	-.027
10	295.	.129
11	242.	.059
12	245.	.016

THE COMPOSITE RELIABILITY COEFFICIENT IS .501

THE MEAN RELIABILITY COEFFICIENT IS .062

\*\*\* THE DALLIES \*\* JUNE 10, 1965

# GRADED ENROLLMENT BY YEARS

YEARS *	SCHOOL GRADES											
	1	2	3	4	5	6	7	8	9	10	11	12
1955 *	227.	204.	272.	206.	233.	206.	164.	190.	239.	223.	211.	175.
1956 *	253.	214.	214.	230.	188.	238.	207.	170.	275.	245.	201.	205.
1957 *	259.	239.	189.	217.	228.	197.	223.	215.	220.	275.	225.	178.
1958 *	262.	242.	222.	209.	212.	238.	198.	226.	314.	229.	255.	211.
1959 *	282.	254.	236.	214.	218.	222.	246.	197.	335.	280.	214.	230.
1960 *	269.	290.	249.	247.	222.	226.	233.	242.	325.	274.	199.	219.
1961 *	273.	261.	292.	227.	242.	221.	228.	235.	272.	199.	253.	208.
1962 *	276.	265.	287.	238.	253.	224.	237.	246.	265.	222.	261.	214.
1963 *	268.	248.	255.	272.	244.	262.	220.	248.	265.	265.	222.	251.
1964 *	267.	248.	279.	281.	244.	268.	223.	243.	273.	261.	229.	241.

## PROJECTIONS - IGD BASIS 1 ARITHMETIC AVE \* REGRESSION 2 \*

1965 *	271.	284.	277.	297.	273.	253.	257.	246.	267.	289.	249.	242.
1966 *	276.	288.	283.	307.	282.	258.	263.	252.	277.	292.	250.	245.
1967 *	280.	292.	290.	319.	290.	263.	269.	258.	287.	294.	251.	248.
1968 *	285.	296.	296.	330.	299.	268.	274.	264.	297.	297.	251.	252.
1969 *	289.	300.	303.	342.	307.	273.	280.	271.	308.	299.	252.	255.
1970 *	294.	304.	310.	355.	316.	279.	286.	277.	319.	302.	253.	258.
1971 *	298.	308.	317.	368.	326.	284.	292.	284.	330.	305.	253.	261.
1972 *	303.	312.	324.	381.	336.	290.	298.	290.	342.	307.	254.	265.
1973 *	307.	317.	331.	395.	345.	295.	305.	297.	355.	310.	255.	268.
1974 *	311.	321.	339.	410.	356.	301.	311.	304.	367.	312.	255.	271.

YEARS	GROUPS OF GRADES							
	1 6	1 3	4 6	7 9	9 12	10 12	6 12	
1964	1587.	794.	793.	739.	1004.	731.	1738.	
1965	1656.	832.	823.	771.	1048.	781.	1805.	
1966	1694.	847.	847.	792.	1064.	787.	1837.	
1967	1733.	862.	872.	813.	1080.	793.	1870.	
1968	1774.	877.	897.	835.	1097.	800.	1903.	
1969	1815.	892.	923.	858.	1114.	806.	1938.	
1970	1857.	907.	950.	882.	1131.	813.	1973.	
1971	1901.	923.	978.	906.	1149.	819.	2009.	
1972	1945.	939.	1007.	931.	1168.	826.	2046.	
1973	1991.	955.	1036.	956.	1187.	832.	2084.	
1974	2038.	971.	1067.	983.	1206.	839.	2123.	

\*\*\* THE DALLES \*\* JUNE 10, 1965

GRADES COMPUTED LINEAR REGRESSION EQUATIONS

\*\*\*\*\*

1	2	Y =	244.600 +	3.455 X
2	3	Y =	217.933 +	5.194 X
3	4	Y =	197.400 +	8.745 X
4	5	Y =	195.400 +	7.036 X
5	6	Y =	204.733 +	4.303 X
6	7	Y =	203.067 +	4.933 X
7	8	Y =	192.267 +	4.661 X
8	9	Y =	179.533 +	7.576 X
9	10	Y =	267.467 +	1.970 X
10	11	Y =	243.267 +	.715 X
11	12	Y =	211.400 +	2.836 X

X IS TIME

Y IS ENROLLMENT

•- RELIABILITY COEFFICIENTS •-

VALUES UNDER .10 IN ABSOLUTE VALUE ARE CONSIDERED GOOD

GRADES PROJECTED RELIABILITY  
ENROLLMENT COEFFICIENT  
1954

2	286.	.151
3	281.	.039
4	288.	.025
5	258.	.056
6	250.	-.068
7	244.	.095
8	247.	.017
9	262.	-.041
10	295.	.129
11	245.	.069
12	245.	.018

THE COMPOSITE RELIABILITY COEFFICIENT IS .461

THE MEAN RELIABILITY COEFFICIENT IS .062

\*\*\* THE DALLAS \*\* JUNE 10, 1965

# GRADED ENROLLMENT BY YEARS

SCHOOL GRADES												
YEARS *	1	2	3	4	5	6	7	8	9	10	11	12
1955 *	227.	204.	222.	206.	233.	206.	164.	190.	239.	223.	211.	175.
1956 *	253.	214.	224.	230.	188.	238.	207.	170.	275.	245.	201.	205.
1957 *	259.	239.	189.	217.	228.	197.	223.	215.	220.	275.	225.	178.
1958 *	262.	242.	222.	209.	212.	238.	198.	226.	314.	229.	255.	211.
1959 *	282.	254.	236.	214.	218.	222.	246.	197.	335.	280.	214.	230.
1960 *	269.	290.	249.	247.	222.	226.	233.	242.	325.	274.	199.	219.
1961 *	273.	261.	292.	227.	242.	221.	228.	235.	272.	198.	253.	208.
1962 *	276.	265.	287.	238.	253.	224.	237.	246.	265.	222.	261.	214.
1963 *	268.	248.	255.	272.	244.	262.	220.	248.	265.	265.	222.	251.
1964 *	267.	248.	279.	281.	244.	268.	223.	243.	273.	261.	229.	241.

## PROJECTIONS - IGD BASIS 1 ARITHMETIC AVE \* REGRESSION 3 \*

1965 *	271.	283.	275.	294.	273.	252.	257.	244.	263.	289.	251.	243.
1966 *	276.	286.	280.	302.	280.	256.	262.	248.	270.	291.	252.	245.
1967 *	280.	290.	285.	311.	287.	261.	267.	253.	278.	293.	253.	248.
1968 *	285.	293.	291.	320.	294.	265.	272.	258.	286.	295.	253.	251.
1969 *	289.	296.	296.	329.	301.	269.	277.	262.	293.	297.	254.	254.
1970 *	294.	300.	301.	337.	308.	274.	282.	267.	301.	299.	255.	257.
1971 *	298.	303.	306.	346.	315.	278.	287.	271.	308.	301.	255.	260.
1972 *	303.	307.	311.	355.	322.	282.	292.	276.	316.	303.	256.	262.
1973 *	307.	310.	317.	364.	329.	286.	297.	281.	323.	305.	257.	265.
1974 *	311.	314.	322.	372.	336.	291.	302.	285.	331.	307.	258.	268.

GROUPS OF GRADES							
YEARS	1 6	1 3	4 6	7 9	9 12	10 12	6 12
1964	1587.	794.	793.	733.	1004.	731.	1738.
1965	1648.	829.	818.	764.	1046.	783.	1799.
1966	1681.	842.	839.	781.	1059.	788.	1826.
1967	1714.	855.	859.	798.	1072.	794.	1853.
1968	1747.	868.	879.	815.	1085.	799.	1880.
1969	1780.	881.	899.	832.	1098.	805.	1907.
1970	1813.	895.	919.	850.	1111.	810.	1934.
1971	1847.	908.	939.	867.	1124.	816.	1961.
1972	1880.	921.	959.	884.	1137.	822.	1988.
1973	1913.	934.	979.	901.	1151.	827.	2015.
1974	1946.	947.	999.	918.	1164.	833.	2042.



\*\*\* THE DALLIES \*\* JUNE 10, 1965

GRADES COMPUTED LINEAR REGRESSION EQUATIONS

\*\*\*\*\*  
1 2 Y = 244.600 + 3.455 X  
2 3 Y = 217.933 + 5.194 X  
3 4 Y = 197.400 + 8.745 X  
4 5 Y = 195.400 + 7.036 X  
5 6 Y = 204.733 + 4.303 X  
6 7 Y = 203.067 + 4.933 X  
7 8 Y = 192.267 + 4.661 X  
8 9 Y = 179.533 + 7.576 X  
9 10 Y = 267.467 + 1.970 X  
10 11 Y = 243.267 + .715 X  
11 12 Y = 211.400 + 2.836 X

X IS TIME

Y IS ENROLLMENT

•• RELIABILITY COEFFICIENTS ••

VALUES UNDER .10 IN ABSOLUTE VALUE ARE CONSIDERED GOOD

GRADES PROJECTED RELIABILITY  
ENROLLMENT COEFFICIENT  
1964

2	286.	.151
3	281.	.009
4	288.	.025
5	258.	.056
6	250.	-.068
7	244.	.095
8	247.	.017
9	262.	-.041
10	295.	.129
11	245.	.069
12	245.	.018

THE COMPOSITE RELIABILITY COEFFICIENT IS .461

THE MEAN RELIABILITY COEFFICIENT IS .062

\*\*\* THE DALLAS \*\* JUNE 10, 1965

# GRADED ENROLLMENT BY YEARS

YEARS *	SCHOOL GRADES											
	1	2	3	4	5	6	7	8	9	10	11	12
1955 *	227.	204.	222.	206.	233.	206.	164.	190.	239.	223.	211.	175.
1956 *	253.	214.	224.	230.	188.	238.	207.	170.	275.	245.	201.	205.
1957 *	259.	239.	189.	217.	228.	197.	223.	215.	220.	275.	225.	178.
1958 *	262.	242.	222.	209.	212.	238.	198.	226.	314.	229.	255.	211.
1959 *	282.	254.	236.	214.	218.	222.	246.	197.	335.	280.	214.	230.
1960 *	269.	290.	249.	247.	222.	226.	233.	242.	325.	274.	199.	219.
1961 *	273.	261.	292.	227.	242.	221.	228.	235.	272.	198.	253.	203.
1962 *	276.	265.	287.	238.	253.	224.	237.	246.	265.	222.	261.	214.
1963 *	268.	248.	255.	272.	244.	262.	220.	248.	265.	265.	222.	251.
1964 *	267.	248.	279.	281.	244.	268.	223.	243.	273.	261.	229.	241.

## PROJECTIONS - IGD BASIS 2 MEAN PERCENTAGE \* REGRESSION 3 \*

1965 *	272.	283.	275.	294.	273.	252.	257.	244.	263.	289.	251.	243.
1966 *	277.	286.	280.	302.	280.	256.	262.	248.	270.	291.	252.	245.
1967 *	283.	290.	285.	311.	287.	261.	267.	253.	278.	293.	253.	248.
1968 *	288.	293.	291.	320.	294.	265.	272.	258.	286.	295.	253.	251.
1969 *	294.	296.	296.	329.	301.	269.	277.	262.	293.	297.	254.	254.
1970 *	299.	300.	301.	337.	308.	274.	282.	267.	301.	299.	255.	257.
1971 *	305.	303.	306.	346.	315.	279.	287.	271.	308.	301.	255.	260.
1972 *	311.	307.	311.	355.	322.	282.	292.	276.	316.	303.	256.	262.
1973 *	317.	310.	317.	364.	329.	286.	297.	281.	323.	305.	257.	265.
1974 *	323.	314.	322.	372.	336.	291.	302.	285.	331.	307.	258.	268.

## GROUPS OF GRADES

YEARS	1 6	1 3	4 6	7 9	9 12	10 12	6 12
1964	1587.	794.	793.	739.	1004.	731.	1733.
1965	1648.	830.	818.	764.	1046.	783.	1799.
1966	1692.	844.	839.	781.	1059.	788.	1826.
1967	1716.	858.	859.	798.	1072.	794.	1853.
1968	1750.	872.	879.	815.	1085.	799.	1880.
1969	1785.	886.	899.	832.	1098.	805.	1907.
1970	1819.	900.	919.	850.	1111.	810.	1934.
1971	1854.	915.	939.	867.	1124.	816.	1961.
1972	1888.	929.	959.	884.	1137.	822.	1988.
1973	1923.	944.	979.	901.	1151.	827.	2015.
1974	1958.	959.	999.	918.	1164.	833.	2042.

\*\*\* THE DALLES \*\* JUNE 10, 1965

GRADES COMPUTED LINEAR REGRESSION EQUATIONS

\*\*\*\*\*

1	2	Y =	-1.486 +	.960 X
2	3	Y =	-1.511 +	1.013 X
3	4	Y =	15.913 +	.915 X
4	5	Y =	4.990 +	.974 X
5	6	Y =	1.020 +	1.023 X
6	7	Y =	7.525 +	.957 X
7	8	Y =	.671 +	1.031 X
8	9	Y =	29.436 +	1.157 X
9	10	Y =	32.619 +	.779 X
10	11	Y =	25.827 +	.826 X
11	12	Y =	7.035 +	.928 X

X IS ENROLLMENT AT T

Y IS ENROLLMENT AT T + 1

**\*\* RELIABILITY COEFFICIENTS \*\***

VALUES UNDER .10 IN ABSOLUTE VALUE ARE CONSIDERED GOOD

GRADES    PROJECTED    RELIABILITY  
             ENROLLMENT COEFFICIENT  
             1964

2	257.	.036
3	246.	-.118
4	245.	-.129
5	275.	.127
6	248.	-.074
7	265.	.187
8	225.	-.072
9	324.	.185
10	236.	-.094
11	247.	.078
12	210.	-.130

THE COMPOSITE RELIABILITY COEFFICIENT IS    -.003

THE MEAN RELIABILITY COEFFICIENT IS    .112

\*\*\* THE DALLES \*\* JUNE 10, 1965

# GRADED ENROLLMENT BY YEARS

YEARS *	SCHOOL GRADES											
	1	2	3	4	5	6	7	8	9	10	11	12
1955 *	227.	204.	222.	206.	233.	206.	164.	190.	239.	223.	211.	175.
1956 *	253.	214.	224.	230.	188.	238.	207.	170.	275.	245.	201.	205.
1957 *	259.	239.	189.	217.	228.	197.	223.	215.	220.	275.	225.	178.
1958 *	262.	242.	222.	209.	212.	238.	198.	226.	314.	229.	255.	211.
1959 *	282.	254.	236.	214.	218.	222.	246.	197.	335.	280.	214.	230.
1960 *	269.	290.	249.	247.	222.	226.	233.	242.	325.	274.	199.	219.
1961 *	273.	261.	292.	227.	242.	221.	228.	235.	272.	198.	253.	208.
1962 *	276.	265.	287.	238.	253.	224.	237.	246.	265.	222.	261.	214.
1963 *	268.	248.	255.	272.	244.	262.	220.	248.	265.	265.	222.	251.
1964 *	267.	248.	279.	281.	244.	268.	223.	243.	273.	261.	229.	241.

## PROJECTIONS - IGD BASIS 3 LESS HIGH + LOW \* REGRESSION 1 \*

1965 *	274.	255.	250.	271.	279.	251.	264.	231.	311.	245.	241.	220.
1966 *	282.	262.	257.	245.	269.	286.	247.	273.	296.	275.	228.	231.
1967 *	289.	269.	264.	251.	243.	276.	281.	256.	345.	263.	253.	219.
1968 *	297.	276.	271.	257.	249.	250.	272.	291.	325.	302.	243.	242.
1969 *	305.	284.	278.	264.	256.	256.	247.	281.	366.	285.	275.	233.
1970 *	313.	291.	286.	271.	262.	262.	253.	255.	355.	318.	262.	262.
1971 *	321.	299.	294.	278.	268.	269.	259.	261.	324.	309.	288.	250.
1972 *	330.	307.	301.	285.	275.	276.	265.	267.	332.	285.	281.	274.
1973 *	339.	315.	310.	292.	282.	283.	271.	274.	339.	291.	262.	268.
1974 *	348.	324.	318.	299.	289.	290.	278.	280.	346.	297.	266.	250.

YEARS	GROUPS OF GRADES							
	1 5	1 3	4 6	7 9	9 12	10 12	6 12	
1964	1587.	794.	793.	739.	1004.	731.	1738.	
1965	1579.	779.	801.	805.	1017.	706.	1762.	
1966	1600.	800.	800.	817.	1030.	734.	1837.	
1967	1592.	822.	770.	882.	1080.	735.	1894.	
1968	1600.	844.	756.	888.	1112.	787.	1925.	
1969	1642.	867.	776.	894.	1160.	794.	1944.	
1970	1685.	890.	795.	862.	1197.	842.	1967.	
1971	1729.	914.	815.	844.	1172.	848.	1961.	
1972	1774.	939.	836.	864.	1173.	841.	1981.	
1973	1821.	964.	857.	884.	1159.	820.	1987.	
1974	1868.	990.	878.	905.	1159.	813.	2007.	

**\*\* RELIABILITY COEFFICIENTS \*\***

VALUES UNDER .10 IN ABSOLUTE VALUE ARE CONSIDERED GOOD

GRADES    PROJECTED    RELIABILITY  
             ENROLLMENT COEFFICIENT  
1964

2	257.	.036
3	252.	-.096
4	255.	-.092
5	274.	.121
6	252.	-.059
7	263.	.177
8	229.	-.059
9	331.	.211
10	246.	-.059
11	256.	.116
12	216.	-.105

THE COMPOSITE RELIABILITY COEFFICIENT IS .192

THE MEAN RELIABILITY COEFFICIENT IS .103

\*\*\* THE DALLIES \*\* JUNE 10, 1965

# GRADED ENROLLMENT BY YEARS

SCHOOL GRADES												
YEARS *	1	2	3	4	5	6	7	8	9	10	11	12
1955 *	227.	204.	222.	206.	233.	206.	164.	190.	239.	223.	211.	175.
1956 *	253.	214.	224.	230.	188.	238.	207.	170.	275.	245.	201.	205.
1957 *	259.	239.	189.	217.	228.	197.	223.	215.	220.	275.	225.	178.
1958 *	262.	242.	222.	209.	212.	238.	198.	226.	314.	229.	255.	211.
1959 *	282.	254.	236.	214.	218.	222.	246.	197.	335.	280.	214.	230.
1960 *	269.	290.	249.	247.	222.	226.	233.	242.	325.	274.	199.	219.
1961 *	273.	261.	292.	227.	242.	221.	228.	235.	272.	198.	253.	208.
1962 *	276.	265.	287.	238.	253.	224.	237.	246.	265.	222.	261.	214.
1963 *	268.	248.	255.	272.	244.	262.	220.	248.	265.	265.	222.	251.
1964 *	267.	248.	279.	281.	244.	268.	223.	243.	273.	261.	229.	241.

## PROJECTIONS-IGD BASIS 2 MEAN PERCENTAGE \*HIGH SURVIVAL RATIOS

1965 *	272.	256.	252.	279.	283.	252.	269.	232.	324.	253.	252.	223.
1966 *	277.	261.	260.	252.	281.	292.	253.	279.	309.	300.	244.	245.
1967 *	283.	266.	265.	260.	254.	290.	293.	263.	372.	286.	290.	237.
1968 *	288.	271.	270.	265.	262.	262.	291.	304.	350.	345.	276.	282.
1969 *	294.	276.	276.	270.	267.	271.	263.	302.	406.	325.	333.	268.
1970 *	299.	281.	281.	276.	272.	276.	271.	273.	403.	376.	313.	323.
1971 *	305.	287.	286.	281.	277.	281.	277.	282.	364.	374.	363.	304.
1972 *	311.	292.	292.	286.	283.	287.	282.	287.	376.	338.	360.	353.
1973 *	317.	298.	297.	292.	288.	292.	287.	293.	383.	349.	326.	350.
1974 *	323.	304.	303.	298.	294.	298.	293.	299.	390.	355.	336.	317.

## GROUPS OF GRADES

YEARS	1 6	1 3	4 6	7 9	9 12	10 12	6 12
1964	1587.	794.	793.	739.	1004.	731.	1738.
1965	1594.	780.	814.	824.	1051.	727.	1804.
1966	1624.	798.	825.	841.	1098.	789.	1922.
1967	1618.	814.	804.	928.	1185.	813.	2031.
1968	1619.	829.	790.	945.	1253.	903.	2110.
1969	1654.	845.	808.	971.	1331.	926.	2167.
1970	1636.	862.	824.	948.	1416.	1013.	2236.
1971	1718.	878.	840.	923.	1405.	1041.	2245.
1972	1751.	895.	856.	945.	1427.	1051.	2282.
1973	1785.	912.	872.	963.	1408.	1024.	2280.
1974	1819.	930.	889.	982.	1398.	1008.	2288.



\*\*\* THE DALLES \*\* JUNE 10, 1965

COMPUTED SURVIVAL RATIOS  
GRADES

YEARS	1- 2	2- 3	3- 4	4- 5	5- 6	6- 7	7- 8	8- 9	9-10	10-11	11-12
55 56 *	.943	1.098	1.036	.913	1.021	1.005	1.037	1.447	1.025	.901	.972
56 57 *	.945	.883	.969	.991	1.048	.937	1.039	1.294	1.000	.918	.886
57 58 *	.934	.929	1.106	.977	1.044	1.005	1.013	1.460	1.041	.927	.938
58 59 *	.969	.975	.964	1.043	1.047	1.034	.995	1.482	.892	.934	.902
59 60 *	1.028	.980	1.047	1.037	1.037	1.050	.984	1.650	.818	.711	1.023
60 61 *	.970	1.007	.912	.980	.995	1.009	1.009	1.124	.609	.923	1.045
61 62 *	.971	1.100	.815	1.115	.926	1.072	1.079	1.128	.816	1.319	.846
62 63 *	.899	.962	.948	1.025	1.036	.982	1.046	1.077	1.000	1.000	.962
63 64 *	.925	1.125	1.102	.897	1.098	.851	1.105	1.101	.985	.864	1.086

GRADES	HIGH SR	LOW SR	MEAN SR	INTRO SR	STAND. DEV.
1 2	.958	.949	.954	1.020	.037
2 3	1.017	.996	1.007	1.020	.084
3 4	1.000	.977	.989	1.020	.094
4 5	1.006	.989	.998	1.020	.067
5 6	1.034	1.022	1.028	1.020	.047
6 7	1.002	.986	.994	1.020	.066
7 8	1.039	1.029	1.034	1.020	.039
8 9	1.333	1.281	1.307	1.020	.210
9 10	.927	.892	.910	1.020	.142
10 11	.964	.924	.944	1.020	.161
11 12	.972	.952	.962	1.020	.079

LOW SR = MEAN SR - .125 \* STANDARD DEVIATION

HIGH SR = MEAN SR + .125 \* STANDARD DEVIATION

•• RELIABILITY COEFFICIENTS ••

VALUES UNDER .10 IN ABSOLUTE VALUE ARE CONSIDERED GOOD

GRADES PROJECTED RELIABILITY  
ENROLLMENT COEFFICIENT  
1954

2	273.	.102
3	253.	-.093
4	260.	-.074
5	277.	.137
6	249.	-.071
7	267.	.198
8	224.	-.077
9	253.	-.073
10	270.	.036
11	270.	.180
12	226.	-.060

THE COMPOSITE RELIABILITY COEFFICIENT IS .204

THE MEAN RELIABILITY COEFFICIENT IS .100

\*\*\* THE DALLES \*\* JUNE 10, 1965

GRADED ENROLLMENT BY YEARS

SCHOOL GRADES

YEARS *	1	2	3	4	5	6	7	8	9	10	11	12
1955 *	227.	204.	222.	206.	233.	206.	164.	190.	239.	223.	211.	175.
1956 *	253.	214.	224.	230.	188.	238.	207.	170.	275.	245.	201.	205.
1957 *	259.	239.	199.	217.	228.	197.	223.	215.	220.	275.	225.	178.
1958 *	262.	242.	222.	209.	212.	238.	198.	226.	314.	229.	255.	211.
1959 *	282.	254.	236.	214.	218.	222.	246.	197.	335.	280.	214.	230.
1960 *	269.	290.	249.	247.	222.	226.	233.	242.	325.	274.	199.	219.
1961 *	273.	261.	292.	227.	242.	221.	228.	235.	272.	198.	253.	208.
1962 *	276.	265.	287.	238.	253.	224.	237.	246.	265.	222.	261.	214.
1963 *	268.	248.	255.	272.	244.	262.	220.	248.	265.	265.	222.	251.
1964 *	267.	248.	279.	281.	244.	268.	223.	243.	273.	261.	229.	241.

PROJECTIONS-IGD BASIS 6 REGRESSION TYPE 2 \*INTRO SURVIVAL RATIOS

1965 *	284.	272.	253.	285.	287.	249.	273.	227.	248.	278.	266.	234.
1966 *	288.	289.	278.	258.	290.	292.	254.	279.	232.	253.	284.	272.
1967 *	292.	293.	295.	283.	263.	296.	298.	259.	284.	237.	258.	290.
1968 *	296.	297.	299.	301.	289.	268.	302.	304.	264.	290.	241.	263.
1969 *	300.	302.	303.	305.	307.	295.	274.	308.	310.	269.	296.	246.
1970 *	304.	306.	308.	309.	311.	313.	301.	279.	314.	316.	275.	302.
1971 *	308.	310.	312.	314.	316.	318.	320.	307.	285.	320.	323.	280.
1972 *	312.	314.	316.	318.	320.	322.	324.	326.	313.	291.	327.	329.
1973 *	317.	319.	320.	322.	324.	326.	328.	330.	332.	319.	296.	333.
1974 *	321.	323.	325.	327.	329.	331.	333.	335.	337.	339.	325.	302.

GROUPS OF GRADES

YEARS	1 6	1 3	4 6	7 9	9 12	10 12	6 12
1964	1587.	794.	793.	739.	1004.	731.	1738.
1965	1629.	809.	820.	749.	1026.	778.	1776.
1966	1696.	855.	841.	765.	1040.	808.	1865.
1967	1723.	880.	843.	842.	1069.	784.	1922.
1968	1751.	892.	859.	870.	1059.	795.	1933.
1969	1812.	905.	907.	892.	1122.	811.	1998.
1970	1851.	917.	934.	894.	1207.	893.	2101.
1971	1877.	930.	947.	911.	1208.	924.	2152.
1972	1903.	943.	960.	963.	1260.	947.	2231.
1973	1929.	956.	973.	991.	1281.	949.	2267.
1974	1955.	969.	937.	1005.	1304.	967.	2303.

**SAMPLE INTERACTIVE OUTPUT**

PRUN MCISAAC, , , 1  
PRUN Y43004, , , 1  
DATE: 101871 TIME: 235755  
PASSWORD PLEASE  
[REDACTED]

CONTINUE  
OXOT WISE+ADAPPS.ENROLV2  
ACTIVE

ENTER YOUR HEADER INFORMATION

:::?

\*\*\* THE DALLES \*\*\* JUNE 10, 1965

ENTER THE INITIAL GRADE IN YOUR ANALYSIS AS A TWO DIGIT INTEGER

1

ENTER THE HIGHEST GRADE IN YOUR ANALYSIS AS A TWO DIGIT INTEGER

5

ENTER THE BASE YEAR AS A FOUR DIGIT INTEGER

1964

ENTER THE NUMBER OF YEARS OF BACKGROUND  
DATA AS A TWO DIGIT INTEGER

5" 5

ENTER THE NUMBER OF YEARS TO BE PROJECTED AS A TWO DIGIT INTEGER

3

ENTER THE NUMBER OF GRADE GROUPINGS AS A ONE DIGIT INTEGER  
THE MAXIMUM IS EIGHT

2?

2

ENTER GROUPING 1 EACH AS A TWO DIGIT INTEGER

11 3

ENTER GROUPING 2 EACH AS A TWO DIGIT INTEGER

4 5

ENTER THE SURVIVAL VECTOR DESIRED AS X.XX

1020102010201020

ENTER THE DATA, IN A FOUR PLACE FIELD, FOR

1960

269 290 249 247 222

1961

273 261 292 227 242

1962

276 265 287 238 253

1963

268 248 255 272 244

1964

267 248 279 281 244

ENTER THE INITIAL GRADE DATA METHOD AS A ONE DIGIT INTEGER

1

ENTER THE TYPE OF SURVIVAL VECTOR DESIRED AS A ONE DIGIT INTEGER  
 REGRESSION TYPE SET ZERO.  
 NO WILL SUPPRESS PRINT.  
 3NO

ENTER THE FRACTIONAL PART OF THE SD YOU WANT TO DETERMINE  
 THE RANGE OF HIGH AND LOW. PUNCH A DECIMAL IN A FOUR PLACE FIELD  
 .125

**\*\* RELIABILITY COEFFICIENTS \*\***

VALUES UNDER .10 IN ABSOLUTE VALUE ARE CONSIDERED GOOD  
 GRADES PROJECTED RELIABILITY  
 ENROLLMENT COEFFICIENT  
 1964

0000	252.	.017
-5	260.	-.068
-4	241.	-.143
-3	273.	.119

THE COMPOSITE RELIABILITY COEFFICIENT IS -.075

THE MEAN RELIABILITY COEFFICIENT IS .087

ENTER THE INITIAL GRADE DATA METHOD AS A ONE DIGIT INTEGER  
 1

ENTER THE TYPE OF SURVIVAL VECTOR DESIRED AS A ONE DIGIT INTEGER  
 REGRESSION TYPE SET ZERO.  
 NO WILL SUPPRESS PRINT.  
 3

ENTER THE FRACTIONAL PART OF THE SD YOU WANT TO DETERMINE  
 THE RANGE OF HIGH AND LOW. PUNCH A DECIMAL IN A FOUR PLACE FIELD  
 .125

\*\*\* THE DALLES \*\*\* JUNE 10, 1965

COMPUTED SURVIVAL RATIOS  
GRADES

YEARS	1- 2	2- 3	3- 4	4- 5
60 61 *	.970	1.007	.912	.980
61 62 *	.971	1.100	.815	1.115
62 63 *	.899	.962	.948	1.025
63 64 *	.925	1.125	1.102	.897

GRADES	HIGH SR	LOW SR	MEAN SR	INTRO SR	STAND. DEV.
1 2	.946	.937	.941	1.020	.036
2 3	1.058	1.039	1.048	1.020	.077
3 4	.959	.929	.944	1.020	.119
4 5	1.015	.993	1.004	1.020	.091

LOW SR = MEAN SR - .125 \* STANDARD DEVIATION  
HIGH SR = MEAN SR + .125 \* STANDARD DEVIATION

\*\* RELIABILITY COEFFICIENTS \*\*

VALUES UNDER .10 IN ABSOLUTE VALUE ARE CONSIDERED GOOD

GRADES PROJECTED RELIABILITY  
ENROLLMENT COEFFICIENT  
1964

2	252.	.017
3	260.	-.068
4	241.	-.143
5	273.	.119

THE COMPOSITE RELIABILITY COEFFICIENT IS -.075

THE MEAN RELIABILITY COEFFICIENT IS .087

\*\*\* THE DALLES \*\*\* JUNE 10, 1965

GRADED ENROLLMENT BY YEARS

	SCHOOL GRADES				
YEARS *	1	2	3	4	5
*****					
1960 *	269.	290.	249.	247.	222.
1961 *	273.	261.	292.	227.	242.
1962 *	276.	265.	287.	238.	253.
1963 *	268.	248.	255.	272.	244.
1964 *	267.	248.	279.	281.	244.

PROJECTIONS-IGD BASIS 1	ARITHMETIC AVE	*MEAN	SURVIVAL RATIOS
1965 *	266.	251.	260. 263. 282.
1966 *	266.	251.	263. 245. 264.
1967 *	265.	250.	263. 249. 246.

	GROUPS OF GRADES			
YEARS	1	3	4	5
1964	794.		525.	
1965	778.		546.	
1966	780.		510.	
1967	779.		495.	

ENTER THE INITIAL GRADE DATA METHOD AS A ONE DIGIT INTEGER

@FIN

RUNID: Y43004 PROJECT: 8961

USER: 3034

MINIMUM LINE CHARGE \$0.87

\*\*\*\*LINE INACTIVE\*\*\*\*



Systems Cards

@RUN NAME,PROG,USERID,TIME,PAGES

@XQT WISE\*ADAPPS.ENROLV2

\_ Data Cards -

@FIN

If the program is not available in the file, it may be called  
from public tape.

@RUN NAME,PROG,USER ID,TIME,PAGES

@ASG, TM U4760.,T,U4760

@MOVE U4760.,5

@COPY,G U4760.,TPBS.

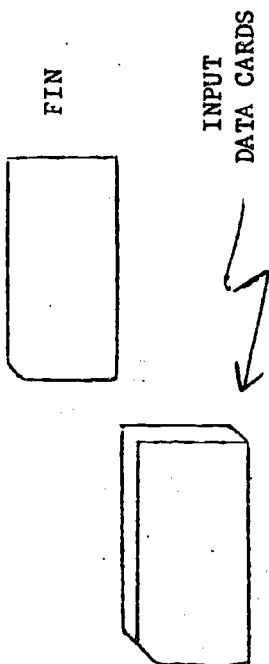
@FREE U4760.

@XQT

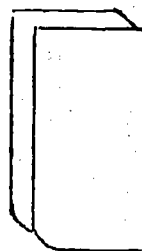
- Data Cards -

@FIN

# ENROLLMENT ANALYSIS



EXECUTE A PROGRAM  
DECK



PROGRAM DECK - cards which describe in FORTRAN,  
the instructions that will solve this problem



FOR, 61 ENROL

EXECUTE A PROGRAM DECK

7 RUN NAME, PROJ, USER ID, 1M  
8

7 XQT WISE\*LIB.ENROL  
8

- Data -

7  
8 FIN

RUN NAME, PROJ, USER ID, 1

# COMPUTER APPLICATIONS TO EDUCATIONAL ADMINISTRATION

## ENROLLMENT ANALYSIS

### Data Form

#### Variable Names

IGR = No. of Grades included in analysis  
 IYR = No. of Years of background data provided  
 IGD = Selection of Method for computation of initial grade data  
     1 = Arithmetic average  
     2 = Mean percentage  
     3 = Mean percentage less High and Low  
     4 = Mean percentage less deviates  
     5 = Regression Time on Enrollment  
     6 = Time on log of Enrollment  
 IPRG = Number of years to be projected (IPRG + IYR = 25)  
 ISRV = Survival vector selection  
     0 = Regression Method  
     1 = High  
     2 = Low  
     3 = Mean  
     4 = Introduced  
 IGF = Initial grade  
     Birth rate = -5  
     Kindergarten = 0  
     Grade 1 = 1, etc.  
 IGL = Highest grade  
 IBASE = Base year - most recent year of background data  
 NG = Number of groups  
 IREG = Regression Methods  
     1 = Enrollment on Enrollment  
     2 = Time on log of Enrollment  
     3 = Time on Enrollment

**TITLE CARD**

**(Ignore all slashes when keypunching)**

# PARAMETER CARD

[illegible]

# GROUP ANALYSIS CARD

[illegible]

**Limit: Eight Groups**

ENROLLMENT DATA CARDS (IG is initial grade) (18F4.0)

[illegible]

INTRODUCED SURVIVAL VECTOR (Insert blank card if not used) (18P4.3)

### IN ADDITIONAL PARAMETER CARDS

$\overline{\text{IGR}}$	$\overline{\text{TYR}}$	$\overline{\text{IGD}}$	$\overline{\text{IPRG}}$	$\overline{\text{ISRV}}$	$\overline{\text{IGF}}$	$\overline{\text{IGL}}$	$\overline{\text{IBASE}}$	$\overline{\text{SVP}}$	$\overline{\text{IREG}}$
$\overline{\text{IGR}}$	$\overline{\text{TYR}}$	$\overline{\text{IGD}}$	$\overline{\text{IPRG}}$	$\overline{\text{ISRV}}$	$\overline{\text{IGF}}$	$\overline{\text{IGL}}$	$\overline{\text{IBASE}}$	$\overline{\text{SVP}}$	$\overline{\text{IREG}}$
$\overline{\text{IGR}}$	$\overline{\text{TYR}}$	$\overline{\text{IGD}}$	$\overline{\text{IPRG}}$	$\overline{\text{ISRV}}$	$\overline{\text{IGF}}$	$\overline{\text{IGL}}$	$\overline{\text{IBASE}}$	$\overline{\text{SVP}}$	$\overline{\text{IREG}}$

Additional parameter cards are a duplicate of the original parameter card, except that only those values in the box may be changed. They are: IGD, IPRG, ISRV, SVP, IREG.

END WITH BLANK CARD EVEN IF NO ADDITIONAL  
PARAMETER CARDS ARE USED

## REFERENCES

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